such merely relations of analogy? If so, they are expressed; but I cannot help thinking, that the relation is still stronger than that of mere representation.

All geological forms may I think be referred with ease to the foregoing arrangement, even the most anomalous in appearance, such as *Aphalaspis*; for this fossil form may, in my opinion, be understood by looking at the head of *Platycephalus*. However, the most extraordinary forms of fossil fish belong to the *Ganoids* of Agassiz, or rather to the *Sturiones*, and those other orders of the class Pisces that present the fewest existing forms. But on this head I shall at once frankly say, that if any fossil forms can be shown not to fall into a place in the preceding arrangement, then my general view of Ichthyological affinities is wrong; for I am convinced that there is but *one* system for all animals, whether Antediluvian or not. I shall write you on *Echinidæ* in my next, and send you some the very first opportunity.

XXV.—*Contributions to the Ichthyology of Australia.* By John Richardson, M.D., F.R.S., &c., Inspector of Hospitals, Haslar.

[Continued from p. 131.]

Uranoscopus maculatus (*Forster*), Bearded Uranoscope.

Uranoscopus maculosus, Soland. Pisc. Austr. MSS. p. 21.
———— *maculatus*, G. Forst.; Fig. Nos. 176, 177, Banks. Libr.
———— *monopterygius*, Bl. Schn., p. 49, ex notis J. R. Forsteri, nomine specifico ejus mutato.
———— *cirrhosus*, Cuv. & Val. iii. p. 314. An. 1829.
———— *Forsteri*, Id. iii. p. 318.
———— *Kouripoua*, Less., Voy. &c. par M. Duperrey, 1830, pl. 18.

On Cook's first voyage a Uranoscope with a single dorsal was procured at Tolaga, in latitude 38½°, New Zealand, the colours of which were briefly described by Solander in his 'Pisces Australiæ;' but as the details of structure were not given, and no figure was taken, it remained for future observers to furnish a proper character of the species. On the second voyage of our immortal navigator this Uranoscope was again obtained on the coast of New Zealand, at Queen Charlotte's Sound, in latitude 41°. The two pencil sketches above quoted were on this occasion made by George Forster, and in 1801 the species was described under the designation of *monopterygius* by Schneider in his posthumous edition of Bloch, from the manuscripts of J. R. Forster. The term *maculatus* is inscribed on G. Forster's sketches, and it is also noted that the native name of the fish is 'Bedee.' Just fifty years after Cook's second voyage, M. Lesson, one of the naturalists of La Coquille, commanded by Capt. Duperrey, discovered the same species, or one very nearly alike, in the Bay of Islands, where it bore the

name of 'Kouripoua.' Under this, as a specific appellation, M. Lesson has figured and described the fish in the zoological part of Duperrey's voyage, which appeared in 1830; but he therein claims 1827 as the date of his first publication of the species. The third volume of the 'Histoire des Poissons' contains a full description of M. Lesson's specimen, under the name of *cirrhosus*. Though Cuvier was inclined to consider Lesson's and Forster's fishes to be the same, he separated them in the work just quoted, because no mention is made by Forster of the short mental barbel, and because "il donne à son poisson un sternum, c'est-à-dire un pédicule pectoral, à trois tubercules, qui est bien dans les Uranoscopes ordinaires, mais qui le précédent (*cirrhosus*) n'a pas." The latter objection is however founded on a mistake, for Schneider's text refers to the pelvic bones and not to the pectoral pedicle, his words being "*ventrales* 3 (*poll.*) *longæ, sterno osseo,* 3-*tuberculato insidentes.*" As to the barbel, it may easily escape notice unless looked for, being very short though thickish. George Forster's sketches of the fish are mere outlines, and aid little in supplying details omitted in the description. Indeed, when one considers the many branches of natural history attended to by the Forsters, and the extent of their collections, no surprise will be excited on finding their notes occasionally very brief. Cuvier goes on to say, that even if Forster's fish shall be found hereafter to be the same with *cirrhosus,* this appellation should remain, because neither *maculatus* nor *monopterygius* are sufficiently distinctive. But M. Lesson's name of *Kouripoua* appears to have the priority, and ought in justice to be adopted by those who consider Forster's fish to be a distinct species. I think they are the same, and have therefore restored Forster's term of *maculatus,* being nearly synonymous with the *maculosus* of the first discoverer of the fish, and having been given to the public contemporaneously with Schneider's unnecessary and indiscriminating designation of *monopterygius.* The appellation of 'Kouri-pooa' in the Polynesian language seems to denote that the natives observe an affinity either in form or habits between the Uranoscopes and *Synanceiæ,* the *Synanceia horrida* being called 'Ehohoo-pooa-pooa' at Otaheite.

The museum at Haslar contains a mounted Uranoscope brought from New Zealand by Mr. J. M. Hamilton, Assistant-surgeon of the Royal Navy, which I have no hesitation in considering to be of the same species with Lesson's and Forster's specimens. It corresponds with the figures of both, and except in some of the redder and more delicate tints which have faded, it agrees also with Solander's account of

the colours of the recent fish, as well as with the markings of *cirrhosus* recorded in the 'Histoire des Poissons.' The principal difference I can detect, on carefully going over Forster's, Lesson's and Cuvier's descriptions step by step with the specimen before me, is the very slight one of the granulations of the plates on the head not being conspicuously arranged in lines radiating from nine centres like so many stars (Lesson and Cuvier). Forster uses the phrase '*caput papillis crebris scabrum ordinatis.*'

The top of the head in the specimen is quite flat from the occiput to the end of the snout, and across between the temples, and from the outer margin of one orbit to that of the other. The intermaxillaries descend very slightly when protruded. The soft edge of the snout is cut away in a shallow curve over the pedicles of the intermaxillaries, and between the orbits there is a square membranous space. The bony plates which cover the head are very irregular, and anastomose so with each other, that it requires some attention to make out the number mentioned by Cuvier, namely, two rows of four each, and a single rounded occipital plate on the mesial line. The two outermost plates of the posterior row, and the middle pair of the anterior row, show some granulated lines running forwards and radiating from centres, but all the other plates are rough, with minute rounded points crowded without order. The borders of the orbits are very slightly raised, and the superciliary processes belonging to the middle anterior pair of plates exhibit their granulations in lines. The first suborbitar projects two acute points over the limb of the maxillary; the second and third are considerably broader, but cover only a third part of the cheek. There is a plate of the same form with them, lying just behind the orbit, and looking like a fourth suborbitar; it is required, with its fellow, to complete the number four of the anterior row of cranial plates. All these suborbitars are granulated without order. The preoperculum is curved in the arc of a circle, and is of equal breadth throughout, its upper and lower ends equally obtuse being in the same vertical line. It is coarsely granulated on its upper end, with some faint granular streaks lower down. The operculum is more strongly marked by vertical granular lines, with a few coarser granular points at its upper corner. The roughness of the surface of these bones is concealed by the spongy integument, when the specimen is soaked for a short time in water. The suprascapulars appear in form of oblong plates, densely granulated, and sloping from the mesial occipital ridge, in conjunction with which they form the boundary of the nape. The humeral bone emits a strong spine, which is slightly curved at the point and not very pungent: it is half an inch long, though the tip only protrudes through the integument. The spongy skin of the recent fish will doubtless nearly conceal it. Forster describes it as '*spina valida,*' and Cuvier as 'très-courte et presque cachée sous la peau;' the discrepancy arising, I presume, from Forster having dissected his fish.

The lateral line curves gradually from the outer end of the supra-

scapular towards the beginning of the dorsal, near the base of which it runs, approaching a little nearer in its course; when it arrives at the base of the caudal, it curves suddenly downwards to pass between the middle rays of the fin. Throughout its whole length short lateral branches diverge ventrad, each ending in a mucous pore. In M. Lesson's specimen only the posterior termination of the lateral line could be distinctly traced. The scales of the body are small and of an oblong form: there are none above the lateral lines, nor on the other parts enumerated as naked in the 'Histoire des Poissons.'

The lips are closely fringed with very short slender cirrhi just visible to the naked eye. The teeth are somewhat coarsely and thinly villiform at the symphyses of the jaws, the dental surfaces of the limbs of the intermaxillaries being very narrow, and on the lower jaw restricted laterally to a single series of teeth, which are more conical than the rest. The vomerine teeth are minutely villiform, being scarcely visible to the naked eye; and a cluster of three or four larger ones, crowded together, exists on the fore part of the palate bone, which contains no others.

Rays:—D.—19; A. 18; C. $9\frac{2}{3}$; P. 16; V. 1|5.

It is, as Cuvier suspected, the spinous dorsal which is deficient, all the rays of the existing fin being jointed; and immediately anterior to the first ray there are four obtuse points, like so many interspinous bones pressing up the skin.

In the dried specimen the ground-colour of the back is greenish gray, darkening to black immediately round the spots, which are yellowish white. The distribution of the spots corresponds with Cuvier's description of them. "*Uranoscopus maculosus*. Habitat Tolaga. Piscis supernè virescenti-griseus, maculis rotundis dilutè et sordidè flavicantibus, subtus e virescente albus. Caput supra cavernosum, pallidè e flavicante et griseo nebulosum. Oculi parvi: iris griseo et albido marmorata: pupilla nigra, supernè et infernè lobulo griseo notata. Pinna dorsalis subglauca, vittâ infra medium latâ, albidâ; radiis supra vittam fuscis, apicibus rubicundis. Pinnæ pectorales extus olivaceæ, maculis rotundis e virescente albidis, fulvoque marmoratis; internè obscuriores, basi colore pectoris; margines anteriores et posteriores albidæ. Pinnæ ventrales et pinna analis colore pectoris. Pinna caudalis e rubicundo grisescens, fasciâ ante medium interruptâ, latâ, sordide ex albido virescens: margo posticus rubescit." (Solander.)

Mr. Hamilton's specimen measures eight inches, being smaller than either Forster's or Lesson's.

Polynemus plebeius (*Broussonnet*), Plebeian Polyneme.

Polynemus plebeius, Brousson. Ichth. Bl. Schn., p. 17. Cuv. & Val. iii. p. 380.

No. 38. Lieut. Emery's drawings.

This species probably inhabits all parts of the Indian and Polynesian seas. It has been taken in the Red Sea, at the Mauritius, Pondicherry, Java, Tanna and Otaheite. Lieut. Emery's drawing was made from a specimen taken on the

north-west coast of Australia, and corresponds very closely with Broussonnet's figure. If the *Sele* of Buchanan-Hamilton be the same, the species attains a considerable size, for he states that in the estuary of the Ganges it weighs as much as 24lbs. Lieut. Emery's measured only $7\frac{3}{4}$ inches, and those sent to Cuvier were also of small dimensions.

Lieut. Emery's drawing represents the colours of the recent fish as being bluish gray on the back, fading towards the under surface into white, with a pinky tinge: no spots or streaks on the body. The ventrals, anal and caudal are pale sulphur-yellow, the dorsal and pectoral colourless. All the fins except the ventrals are closely dotted with minute angular specks of verdigrise-green.

The *Polynemus tetradactylus* (Shaw), Cuv. & Val. iii. p. 375, is an inhabitant of the north-east coast of Australia, having been discovered in Endeavour River on Cook's first voyage, and then named by Solander *P. quaternarius*. This species also ranges to the Indian Sea.

Upeneus Vlamingii (*Cuv.*), Vlaming's Upeneus.

Labrus calophthalmus, Soland. Pisc. Austr. p. 35. Parkins. fig., Banks. Libr.

Upeneus Vlamingii, Cuv. & Val. iii. p. 452.

This fish was taken off the island of Motuaro in Queen Charlotte's Sound, on Cook's first voyage. A figure partially executed by Parkinson exists in the Banksian Library, and there are a few notes of the original colours added in pencil, a copy of which we subjoin, together with some additional notices of the tints by Solander.

"The part marked 2 on the face is pale green; the belly pale crimson, spotted all over with yellow; the spots on the bases of the scales somewhat deeper. The streaks on the face, the spots on the back and on the dorsal and anal, the outer circle of the eye and the streaks on the tail, ultramarine with a cast of purple; the streaks on the face and spots on the back being the deepest." (Parkinson.)

"Caput cæruleo-violaceum areis luteis. Dorsi et laterum maculæ subcastaneæ seriales. Oculi pulcherrimi. Iris in periphæriâ cyanea, propè pupillam miniata: annulus miniatus, latus, extrudens anticè unicum, posticè duo brachia, per annulum periphæriæ extensa. Cirrhi submentales longitudine capitis, basi incarnati, medio albidi, extus flavi. Habitat in oceano Australiæ propè Motuaro." (Solander.)

The *Scorpænæ* appear to be numerous in the Australian seas. The following, being described solely from drawings or imperfect notices, are merely given as doubtful species, for the purpose of directing the attention of naturalists visiting the coasts of New Holland or New Zealand to a careful comparison of such of the fish of this genus as they may procure.

Scorpæna cardinalis (*Solander*).

Scorpæna cardinalis, Soland. Pisces Australiæ, ined. p. 28.
————————, Parkinson, fig. 12, No. 10, Bibl. Banks.

On Cook's first voyage a *Scorpæna* having a strong general resemblance to *scrofa*, but wanting the black mark on the dorsal fin, was discovered at Motuaro in Queen Charlotte's Sound, New Zealand, of which a lengthened description was made by Solander, as above quoted, and a pencil sketch by Parkinson. As it seems to be a different species from any described in the 'Histoire des Poissons,' I have transcribed Solander's notes below, with the omission of two or three trivial passages. The *Scorpæna cottoides* of Forster, taken in Dusky bay, a more southern part of the same island, is evidently distinct from *cardinalis*, though there is a reference under Forster's rude sketch (pl. 190.) in the Banksian Library to the MSS. account of *cardinalis*. *Cottoides*, according to the sketch, has two spinous points directly over the eye, while in *cardinalis* there is one before and another behind the orbit: the comparison cannot be carried with confidence much further, because the body colours in which G. Forster's drawing was coarsely executed have faded so as to render the forms of the parts about the head uncertain; but J. R. Forster's notes, as quoted by Schneider, do not correspond with Solander's account of *cardinalis*. Cuvier compares Forster's fish with the *cirrhosa* and *venosa* of the 'Histoire des Poissons.'

Parkinson's figure is drawn of the natural size. The length of the head is rather less than one-third of that of the whole fish, caudal included: its height behind the eye is two-thirds of the length. Spinous points are shown on the nasal bones; one over the anterior and one over the posterior angle of the orbit, three or more on the lateral cranial ridge behind the eye, and some on the temporal ridge extending from the orbit to the upper angle of the gill-opening. There are two apparently on the preorbitar, one over the other, and the edge of the bone where it overlies the limb of the maxillary is irregularly serrated. A series of spinous points mark the ridge of the second suborbitar as it crosses the cheek. The angle of the preoperculum emits a lengthened tapering acute process, on the base of which there is a spinous point. The curved under limb of the bone has four angular points. The outline of the gill-cover is triangular, and there are two spines on the operculum, which do not reach the edge of the membrane. The upper spine appears to have a smaller one at its base.

The spinous part of the dorsal is much arched, and is greatly lowered before the 12th spine. The third spine, measuring in the drawing above an inch and a half, is very slightly higher than the adjoining one before and behind. The others decrease gradually to the 11th, which has scarcely a fifth of the height of the 3rd one. The 12th rises to the height of the 7th, and the 1st and 8th have

half the height of the third. The soft part of the fin occupies as much space as the seven anterior spines, and is about as high anteriorly as the tallest of them, but lowers a little as it runs backwards. It is rounded slightly before and behind.

"Scorpæna capite nudo subtus mutico, corpore miniato, variegato, pinnis maculatis; pectoralibus infernè rotundatis, incrassatis. Habitat in oceano Australiæ propè Motuaro.

"Radii:—Br. 7; D. 12|10; A. 3|5; V. 1|5; C. 16*.

"Diameter longitudinalis 18 uncias; perpendicularis $4\frac{1}{2}$, transversalis 3. Corpus lanceolato-oblongum, pulchrè variegatum. Caput trunco latius, magnum, obtusum, anticè depressiusculum, nudum, cavernosum, spinosum, hinc inde ramentaceum, subtus muticum et absque ramentis. Rostrum anticè obliquè declive, supernè gibbo obtuso præditum, supra hunc gibbum inter anticam partem oculorum carina angusta, inermis. Ramenta capitis plurima, cutacea, brevia; nonnulla supra orbitas oculorum; pauca in laterum angulis prominentibus; par maximum supra aperturam anteriorem narium, ovato-oblongum, planum, extus lacerum; reliqua linearia acuta. Spinæ capitis plurimæ acutæ; par conicum erectum supra gibbum rostri; duæ supra orbitam oculi, unica anticè altera posticè; plures supernè et in lateribus seriatim digestæ, basi compressæ, retrorsum spectantes, præcipue posterioribus quæ longiores, subulatæ.

"Maxilla superior obtusè retusa; inferior apice subtùs gibbo notata. Dentes in maxillis, palato et fauce. Maxillares subulati, conferti, numerosi intus flexi, interiores majores. Palati acerosо-subulati, aggregati, acuti, parvi. Faucium subulati, aggregati, acuti, intus vergentes, numerosi. Lingua glabra. Oculi vicini, magni, convexi, cute capitis communi tecti. Iris argenteo-miniata. Foramen narium posterius propè oculum, nudum, apertum; anterius in medio inter oculum et rostrum, tectum ramento magno, dilatato. Branchiarum laminæ nudæ, posticè angulatæ, angulis spinosis.

"Truncus oblongus, compressus, muticus, squamosus. Linea lateralis pone caput parùm descendens, dein recta, dorso paulo propior. Anus pone medium, pinnâ anali remotus. Vagina genituræ pone anum exserta in papillam ovatam, compressam. Pinna dorsalis bipartita: pars anterior spinosa, 11-radiata: pars posterior altior sed brevior, 11-radiata, radio primo spinoso. Pinnæ pectorales medium trunci non attingentes, latissimæ, rotundatæ, cute crassâ indutæ, radiis inferioribus crassissimis extra membranam parùm productis. Pinnæ ventrales obtusæ, parùm pone pectorales insertæ, illisque paulo breviores. Pinna analis, radiis tribus spinosis, reliquis longioribus subæqualibus. Squamæ læves, integræ, mediocres adherentes.

"*Color.*—Totus piscis pulchrè miniato-aurantiacus, maculis majoribus rubris; minoribus albis et numerosioribus, parvis fusco rubentibus variegatus: subtus pallidior maculis majoribus albidis ornatus. Pinna dorsalis dorso concolor. Pinnæ pectorales saturatius

* The numbers of rays are those given by Solander, the notation solely being changed. It may be proper to remark, that when Solander began his notes on the productions of New Zealand, he supposed that he was on the coast of a southern continent.

miniatæ, subtessellatæ maculis serialibus majoribus; exterioribus nigricantibus. Pinnæ ventrales et analis pallidæ, adspersæ maculis rubris, in pinnâ anali majoribus. Pinna caudalis maculis subserialibus majoribus ornata, posticè aurantiaca." (Solander.)

Another New Zealand *Scorpæna* is noticed in Solander's 'Pisces Australiæ;' but as he describes merely its colours, and there is no drawing of it extant, nothing is known of its form. He designates it *Scorpæna plebeia*, probably from the contrast which its duller general tints make with his *cardinalis*, and describes its colours as follows:—

"Scorpæna plebeia. Piscis dilutè e cinereo virescens, nebulis fuscescentibus. Caput infra, pectus et abdomen albida, cum pauxillo rubedinis. Iris e griseo argentea, nebulis fuscis. Pupilla nigra. Pinna dorsalis colore dorsi, apice rubicunda. Radii partis posterioris albido et purpureo pallidè annulati. Pinnæ pectorales e rubicundo et flavescenti pulchrè tessellatæ, areâ propè basin altius coloratâ. Pinnæ ventrales saturatè et vividè incarnatæ, in medio albæ. Pinna analis ex albido incarnata, nebulis pallidè violaceis. Pinna caudalis rubicunda, maculis fuscis subfasciata. Habitat Tolaga." (Lat. $38\frac{1}{2}^{\circ}$ S., long. $181\frac{1}{4}^{\circ}$ W.)

Considerable variety exists in the extent to which the scales spread over the head in the *Scorpænæ*. Cuvier says, "à peine voit-on sur les individus desséchés quelques petites écailles sur le derrière du crâne et le haut de l'opercule. Il existe d'autres poissons (les *Sebastes*) de cette famille, dont la tête moins hérissée, a des écailles sur toutes ses parties; au museau, au maxillaire, à la joue, et à toutes les pièces operculaires; en sorte qu'ils se rapprochent de plusieurs perches à dorsale unique." The want of the temporal ridge and its spines is the only positive character of those here mentioned which I have observed on comparing the *Scorpænæ* and *Sebastes*, which serves to distinguish the latter. The *Scorpæna Novæ Guineæ*, Voy. Astrolabe, pl. 12. f. 1, has the whole cheek and gill-cover just as scaly as the *Sebastes Capensis*, fig. 5 of the same plate. The *Scorpæna bufo* (of which a specimen exists in the Haslar Museum well characterized by its dentated nasal spines, and the white drops in the axilla of the pectoral) has the cheek entirely covered with scales nearly as large as those on the body, and also patches of scales on the gill-cover. The Van Diemen's Land *Scorpæna miles*, described by me in a paper read before the Zoological Society in June 1839, has many scales on the head, but otherwise is very similar in form to *porcus*, which has the same parts naked. These scales are concealed by the spongy integument of the recent fish, and may have been overlooked if they actually existed in the following species drawn by Lieut. Emery.

SCORPÆNA BURRA (*Nob.*), Crimson and olive Scorpæna.

No. 29. Lieut. Emery's drawings.

The fish from which the drawing above quoted was made, was taken at Depuch island, and measured five and a half inches in length.

In the general form of the head, particularly in the obtuse snout, arched from the eye, the drawing resembles *cardinalis*, but the spines on the sides of the head are much less conspicuous than in that species. The profile is moderately convex from the mouth to the dorsal fin; the eye rises above the general curve, without any denticulations being shown on the superciliary ridge, though the orbit is fringed above with very short cirrhi, and one large one rises directly from its middle, nearly as high as that of *grandicornis*, but of a tapering form, with an acute tip, and beaded or warty below. There is a short spine on the nasal bone, and three or four pretty prominent angular points on the lateral occipital ridge. There are two short spines on the operculum, but no others are clearly marked on the side of the head; which is scaleless, and is veined by lines of a deeper colour than the general tint, that ramify like a blood-vessel. The membrane beneath the lower jaw swells out and is reticulated by fine crimson lines, which give it a scaly appearance. There are many simple tapering cirrhi depending from the lips, the sides of the head, and all parts of the body, not more numerous on the lateral line than elsewhere.

The dorsal is considerably arched, particularly anteriorly. The fourth spine is the tallest, the twelfth is scarcely one-fourth lower, while the first and eleventh are only half as high. The membrane slopes much behind the four anterior spines. The soft part of the fin is much rounded, and rises one-third higher than the tallest spine. The anal is shaped like the soft dorsal: its second spine is represented as strong, but the first is omitted, probably from its shortness: seven rays in all are shown. The other fins are also greatly rounded.

The head and body are crimson, which fades to reddish white on the branchiostegous membrane; the side of the head is veined with deeper lines. There are ten round red drops on the gill-membrane. All the cirrhi are green, and the body is marked by a few irregular olive or oil-green blotches: the largest is near the base of the anal, and there are three or four smaller ones on the sides: a rhomboidal one is placed near the shoulder, half of it extending to the spinous dorsal, and taking in the third, fourth, fifth and sixth spines. There is an oval one further back on the same fin, crossing the middles of the seventh and eighth spines. A very irregular blotch partially covers the anterior third of the soft dorsal descending a short way on the back, and there are two on the posterior border of the fin. The olive colour forms two broad transverse bars on the pectoral, one near its base, and the other about its middle. There are three narrower bars on the caudal fin, a basal, middle, and subterminal one. The crimson anal is crossed by three narrow white ribands, and its

broad border, occupying nearly a third of the depth of the fin, is minutely speckled with yellowish green. The ventrals are crossed by five crimson bars alternating with four yellow ones, and the first ray is streaked with vermilion.

SCORPÆNA PANDA (*Nob.*), Saddle-skull Scorpæna.

No. 9. Lieut. Emery's drawings.

The drawing was made from a specimen procured at Abrolhos, and measuring sixteen inches and a half in length. It differs from any described Scorpæna in the form of the head and size of the scales covering the body, as well as in its colours.

The body has the usual generic form: its height is rather less than one-fourth of the total length of the fish, caudal included. The head is short, its length scarcely equalling the height of the body, and its height being one-fourth less. The orbit projects upwards, and behind it there is a saddle-shaped depression, followed by an occipital rise much like that of a dried example of *Synanceia horrida*. The orbit is surrounded by irregular angular projections, three above and as many behind. The occipital rise is margined laterally by a curved ridge, joining another waving one which flanks the base of the rise, and reaches the upper angle of the gill-opening. There are also apparently spines and ridges on the sides of the head, but not sufficiently intelligible to be described. The scales of the body are unusually large for a Scorpæna, there being only thirty-five in a row between the gill-opening and caudal fin, and about sixteen in a vertical line. There are none on the head.

The dorsal shows only eleven spines, but it is probable that a short one has been omitted at the commencement of the fin. The second of those seen is the tallest, overtopping the one before and behind it by a fourth part. The succeeding ones diminish rather rapidly, the penultimate one not having one-fifth of the length of the tallest: the last one rises to the level of the first or third. The membrane slopes deeply behind the anterior spines. The soft part of the fin, which is rounded, overtops the tallest spine by about a fifth part. The anal is of the same height with the soft dorsal, but is less broadly rounded: its third spine is stronger and longer than the second one. The pectorals, ventrals and caudal are also rounded.

RAYS:—D. 11(12?)|10; A. 3|6; C. 15; P. 16; V. 1|5.

The head and body have a nearly uniform vermilion tint, the branchiostegous membrane alone being paler. There are two dark hyacinth-red bands on the side, the anterior one descending from nearly the whole of the spinous dorsal and tapering away behind the pectoral; and the other, rather narrower, running from the soft dorsal nearly to the anal, tapering also as it descends. The body is spotted pretty regularly with round drops of dark orange-brown, which do not extend to the belly. Smaller drops of the same colour are scattered over the sides of the head, lower jaw, and branchiostegous membrane, being intermixed in the two latter localities with whitish spots. All the fins are reddish brown, and except the ven-

trals and spinous part of the dorsal, they are all spotted on their lower halves like the body, three or four rows on each. There are also two or three rows of paler spots on the upper part of these fins.

SCORPÆNA ERGASTULORUM (*Nob.*), Port Arthur Scorpæna.

None of the *Scorpænæ* of the southern seas described in the 'Histoire des Poissons' are said to have the black mark on the posterior third of the spinous dorsal which characterizes the Mediterranean *scrofa*. That spot is however strongly marked in the drawing of a Scorpæna made under Dr. Lhotsky's direction, at the penal settlement of Port Arthur, in Van Diemen's Land.

This species resembles *porcus* in general form. Its spinous dorsal is moderately arched, and not deeply notched at the eleventh spine. The fourth spine is the tallest, and the soft rounded part of the fin rises to an equal height with it. The nine inferior rays of the pectoral are represented as simple, the caudal as scarcely rounded. The second anal spine is rather the longest of the three, which come nearer to the length of the soft rays than usual.

A spine and apparently a short cirrhus are represented on the nasal bone: four spines on the preorbitar, four on the upper margin of the orbit, one of them over the anterior canthus and three on the posterior third of the margin: two prominent ones on the lateral occipital ridge, four on the temporal ridge: a series of seven on the suborbitar ridge, and three strong angular points on the lower limb of the preoperculum. The two opercular spines are longer and more acute than any of the others, and the lower one is curved upwards. There is a close series of conical points (cirrhi?) on the lateral line. The temples and upper halves of the cheek and gill-cover are represented as scaly. The scales of the body are rather small.

The prevailing colour of the fish is scarlet, obscured in many places by large blotches of purplish or brownish red, particularly along the base of the dorsal, over the pectoral, and on the top of the head. These blotches pass insensibly into the ground-colour, and do not produce defined markings. The scarlet of the fins has a lakish tinge, and passes into carmine towards their edges. There is a brown mottled patch on the pectoral, at the base of the upper rays, and the jointed rays of all the fins but the pectorals are marked with reddish brown dots, disposed in rows. There is also some indistinct brown and reddish speckling on the membranes of the vertical fins, and an oval black spot crosses the ninth, tenth and eleventh dorsal spines.

RAYS:—P. 15; D. 12|9; A. 3|5; V. 1|5.

The same black dorsal mark exists on a New Zealand *Scorpæna* taken on Cook's first voyage, and described as follows by Solander:—

"SCORPÆNA CRUENTA. Habitat in oceano propè 'Cape Kidnappers.' Corpus saturatè sed obscurè rubrum, nebulis subfasciatis paucis pallidè lutescentibus pictum, subtus dilutè sanguineum ne-

bulis albis. Iris rubro-argentea. Pinna dorsalis; pars prima obscurè rubra, rivulis paucis subpellucidis, posticè nebula nigra oblonga; pars posterior anticè, propè basin, maculâ intensè sanguineâ notata, alias rubicunda maculis nigricantibus adspersa. Pinna ventralis sanguinea, nebulis pellucidis. Pinna analis sanguinea, maculis paucis nigris. Pinna caudalis rotundata, rubra, maculis nigris in quatuor fascias per radios dispositis ornata. Membrana connectens immaculata."

[To be continued.]

XXVI.—*On the genus* Scarabus, *a small group of* Pulmobranchiate Mollusks *of the family* Auriculacea. By Mr. Lovell Reeve, A.L.S.

[With a Plate.]

To the Editors of the Annals of Natural History.

Gentlemen,

Having collected together an interesting series of *Scarabi*, as examples of that genus, for the forthcoming number of my 'Conchologia Systematica,' I send you my plate of them accompanied with the following notices, not intended for publication there, which you are at liberty to make use of if you think proper. The fact of there being so few species of this genus yet described, and even these referred to by authors with no little inaccuracy, induces me to think that a few observations, though brief, will be esteemed of some conchological interest. No descriptions are given, nor are any of the localities mentioned; I am unwilling that this paper should be accepted as a monograph, as my friend M. Petit de la Saussaye is zealously employed at this moment in preparing a complete history of the family to which the genus *Scarabus* belongs.

SCARABUS, De Montfort.

The genus *Scarabus* is one of the few that I have adopted out of the many proposed by De Montfort in his 'Conchyliologie Systématique.' The earliest figure which I am able to trace is one of the *Scarabus Petiverianus* given by Petiver under the title of *Cochlea Bengalensis* in his 'Gazophylacia Naturæ;' another species, the *Scarabus imbrium*, figured by Chemnitz, was then described by Linnæus amongst the *Helices*, and probably supposed to be the same. Bruguière included it in his miscellaneous assemblage of *Bulimi*, and it was removed with others by Lamarck for the formation of the